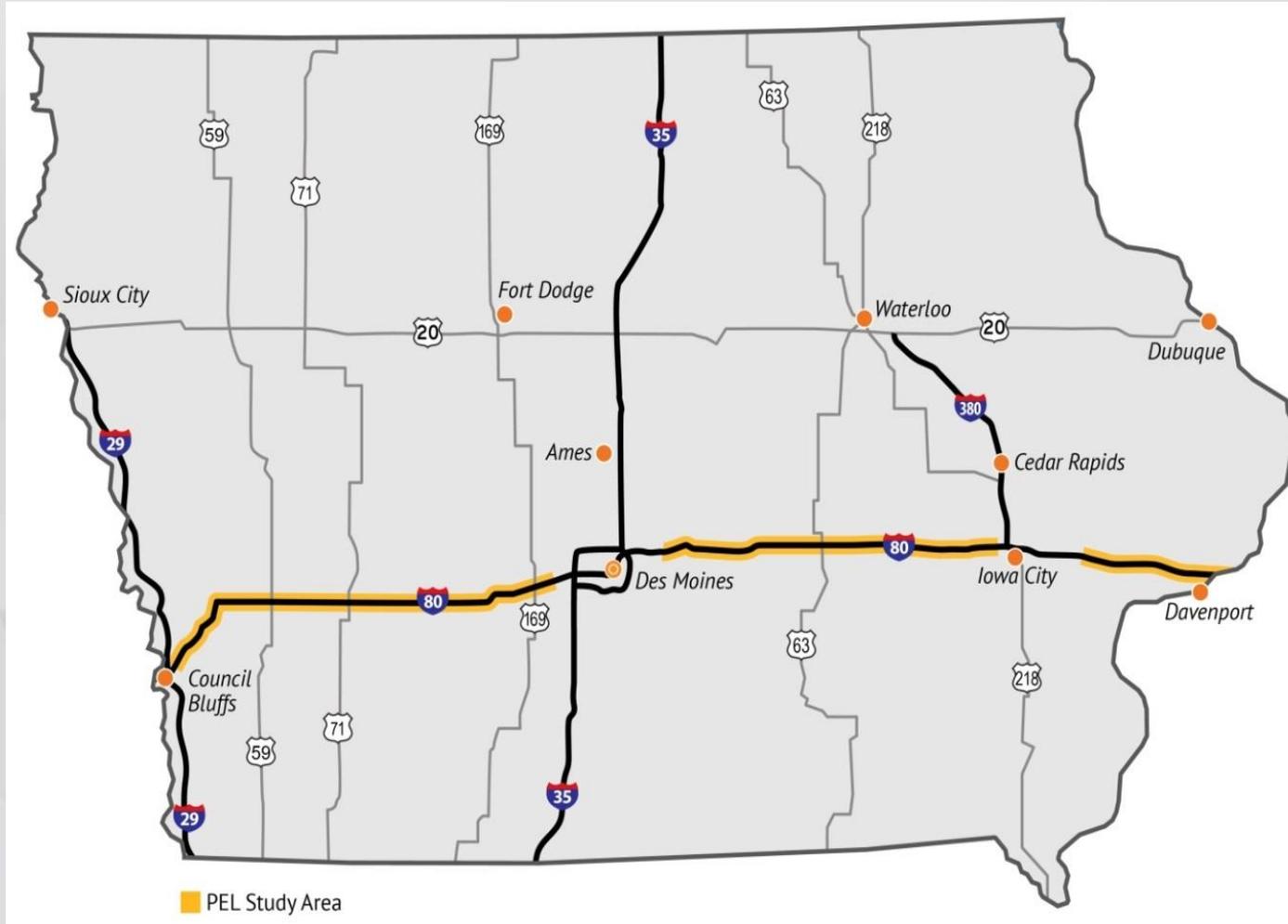


# I-80 Planning and Environmental Linkages (PEL) Study

# I-80 PEL Study Area



# Outcomes of I-80 PEL Study

- Define a long-term **I-80 Vision**
- Increase mobility across the interstate system, while balancing access
- Develop implementation plan for best strategy
- Prioritize segments of the interstate for further development

## Process

- Follow the Planning Environmental Linkages (PEL) model
- Establish a vision and goals for the system
- Take a corridor wide approach
- Evaluate safety, capacity, and infrastructure deficiencies
- Study several improvement strategies early in the planning process



# Schedule & Status

## Technical Memos

• Public Involvement Plan	DONE	IN HOUSE
• Guiding Principles	DONE	IN HOUSE
• Overhead Bridge Structures	DONE	IN HOUSE
• Truck Accommodation	DONE	IN HOUSE
• Diversion Strategies	DONE	IN HOUSE
• Automated Vehicles	DONE	CONSULTANT
• Modal Options	DONE	CONSULTANT
• Tolling Considerations	DONE	CONSULTANT
• Resiliency and Vulnerability	DONE	CONSULTANT
• Existing Conditions Analysis	DONE	CONSULTANT
• Vision for Infrastructure Invest.	Draft Spring 2018	CONSULTANT

**INTERSTATE 80**  
**PLANNING STUDY (PEL)**

# Public Involvement

Project Website

[www.iowadot.gov/interstatestudy](http://www.iowadot.gov/interstatestudy)

- **Over 1,700 Subscribers**
- **Over 5,500 surveys filled out**



**Public Meeting #1 Complete July 2016  
(online)**



**Public Meeting #2 – Complete July 2017  
(online)**



**Public Meeting #3 – Complete February 2018  
(online)**



**Public Meeting #4 – Coming late Spring 2018  
(in-person)**



# Guiding Principles- Technical Memo

- The study is for the rural portions of I-80
- Separate studies for the urban areas
- Design Parameters
  - Year: 2040
  - Design Speed: 75 mph (rural sections)
  - Minimum interchange spacing: 3 miles (rural); 1 mile (urban)
  - Level of Service: B (rural); C (urban)



# Overhead Bridge Structures



The bridges crossing over I-80 were prioritized based on three criteria and scored to determine priority for replacement.

The three criteria include:

- Average Daily Traffic (ADT)
- Maximum out of distance travel
- Minimum out of distance travel

# Criteria for Evaluating Overhead Bridge Structures

Average Daily Traffic (ADT)	Maximum Out of Distance Travel	Minimum Out of Distance Travel
1 – Over 140	1 – Over 8.40 miles	1 – Over 1.88 miles
2 – 99 to 140	2 – 6.88 to 8.40 miles	2 – 1.11 to 1.88 miles
3 – 61 to 98	3 – 6.01 to 6.87 miles	3 – 0.83 to 1.10 miles
4 – 44 to 60	4 – 5.11 to 6.00 miles	4 – 0.29 to 0.82 miles
5 – Under 43	5 – Under 5.10 miles	5 – Under 0.28 miles

1. **Highest** priority to replace: The crossing is needed for regional access and connectivity...may cause hardship to the local travel if eliminated.
2. **Moderate** priority to replace: moderate need for the crossing for regional access and may cause moderate hardship to local travel if eliminated.
3. **Average** priority to replace: average need for the crossing for regional access and connectivity...elimination may cause some hardship to local travel.
4. **Low** priority to replace: minor hardship to access and connectivity if eliminated.
5. **Lowest** priority to replace: localized traffic needs and hardship is limited.



# Overhead Bridge Structures

## Recommendations

Total of 64 bridges analyzed

- 40 of the 64 (63%) of the bridges analyzed currently carry less than 100 vehicles per day (vpd)
- 37 of the 64 (58%) of the bridges analyzed would have a minimum out of distance travel of less than 1-mile
- 43 of the 64 (67%) of the bridges analyzed would have a maximum out of distance travel of less than 7-miles
- Over half serve local convenience rather than regional access and connectivity

Replacement Priority	Number of Overhead Structures
1	1
2	16
3	26
4	17
5	4

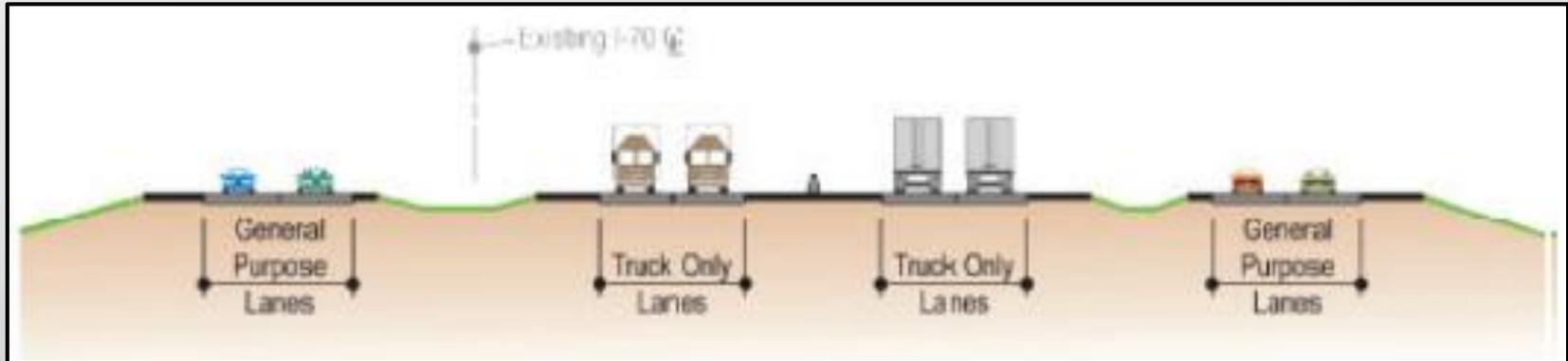


# Truck Accommodation- Technical Memo



- Evaluated the viability of truck only or restricted truck lanes
- Considerations
  - Additional travel modes
  - Speed Differentials
  - Truck restrictions
  - Truck exclusive facilities

# Truck Exclusive Facilities



# Truck Accommodation Recommendations

- Truck only lanes are not reasonable to pursue
- Other modes are additional, not alternate means of travel
- Consider opportunities in the future
  - Lane restrictions
  - Speed restrictions
  - Recommendations from the Iowa Statewide Freight Plan, including intermodal facilities and truck-related support facilities

# Diversion Strategies- Technical Memo



- Will improvements on parallel corridors divert enough traffic from I-80 to change the capacity needs?
- Alternate Corridors
  - U.S. 30
  - U.S. 34
- Criteria Evaluated
  - Cost
  - Traffic Analysis
  - Cost vs Utilization
  - Economic Impacts
  - Affordability
  - Environmental Impacts

# Diversion Strategies - Criteria Evaluated

Five Scenarios analyzed for impacts to:

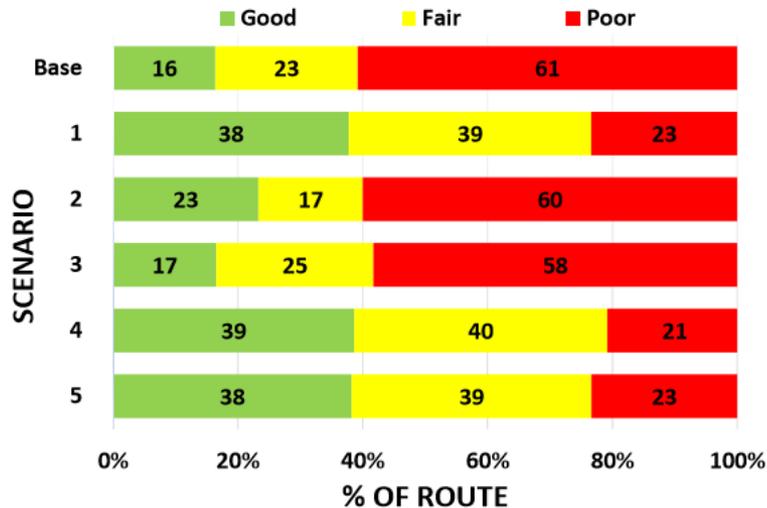
- Level of Service
- Daily Vehicle Miles Traveled (VMT)
- Daily Percent Change in Delay

***Table 4. TRAFFIC SCENARIOS***

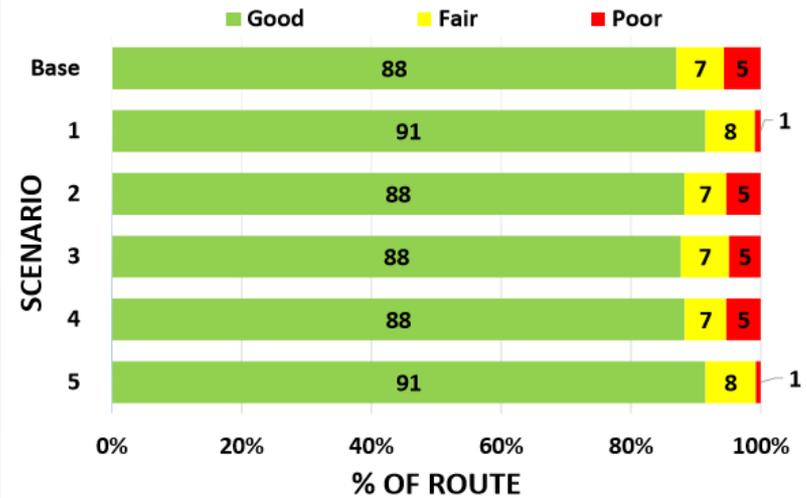
<b>Scenario</b>	<b>Interstate 80</b>	<b>U.S. 30</b>	<b>U.S. 34</b>
Base	No Build	No Build	No Build
1	6 Lanes	No Build	No Build
2	No Build	4 Lanes	No Build
3	No Build	No Build	4 Lanes
4	6 Lanes	4 Lanes	No Build
5	6 Lanes	No Build	4 Lanes

# Level of Service (LOS)

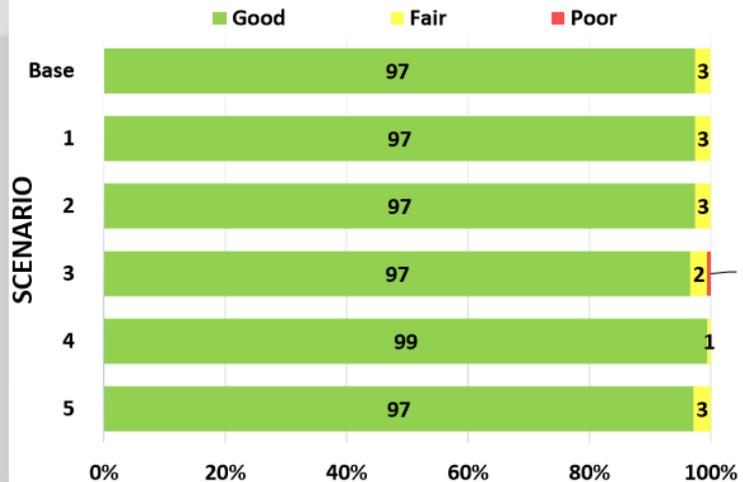
## I-80 LOS IN 2040



## US 30 LOS IN 2040



## US 34 LOS IN 2040



Poor LOS  
 I-80 – 60%  
 U.S. 30 - 5%  
 U.S. 34 – 1%



# Diversion Strategies

## Recommendation

Will improvements on other corridors divert enough traffic from I-80?

**No, it does not appear that enough traffic will divert from I-80 to the other corridors and address the future traffic demands of the system.**

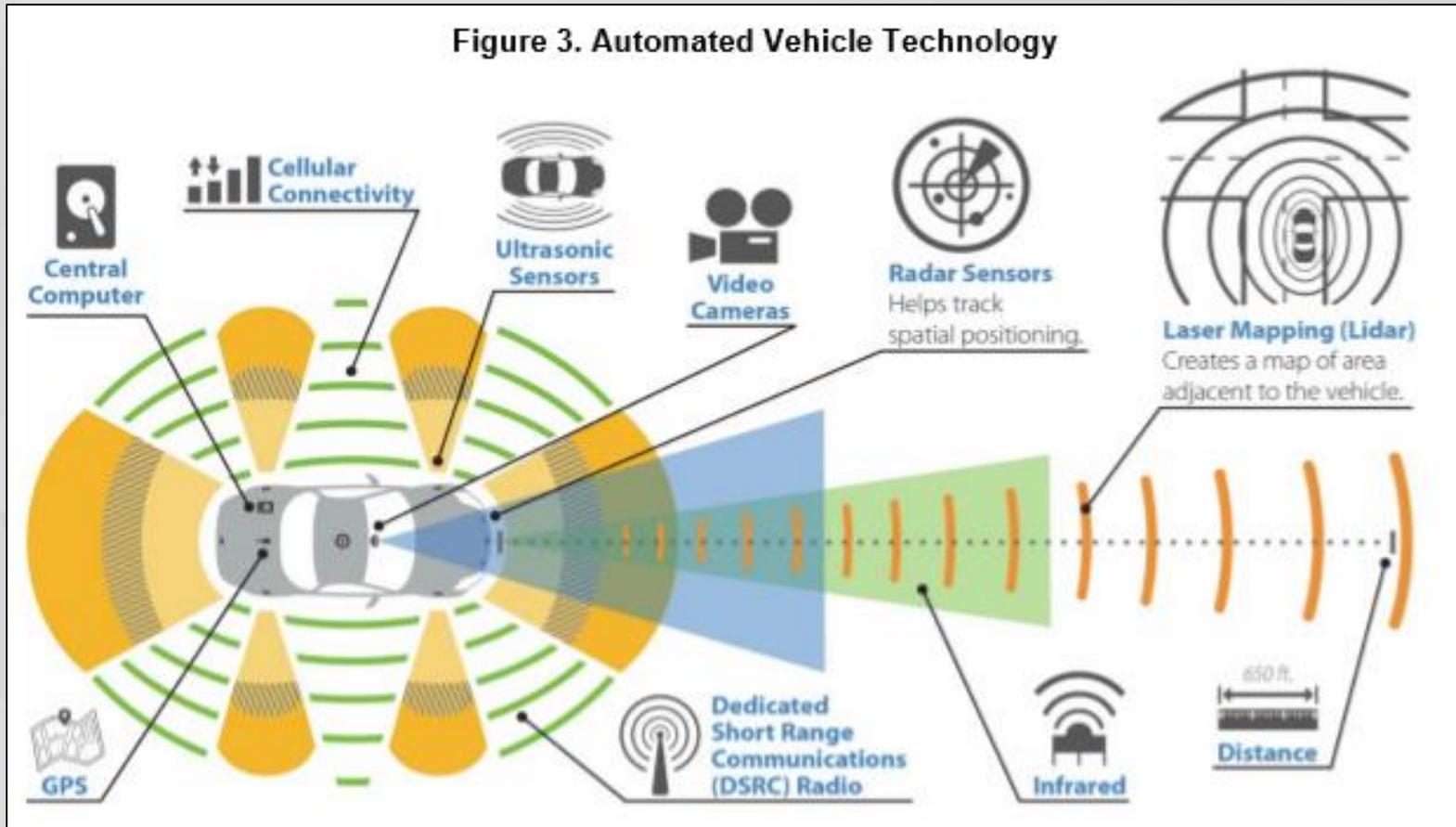
# Automated Vehicles & Emerging Technology



- Evaluate the effect of automated vehicles and emerging technology on:
  - Safety
  - Capacity & Operations
  - Travel Time Reliability
  - Design Elements

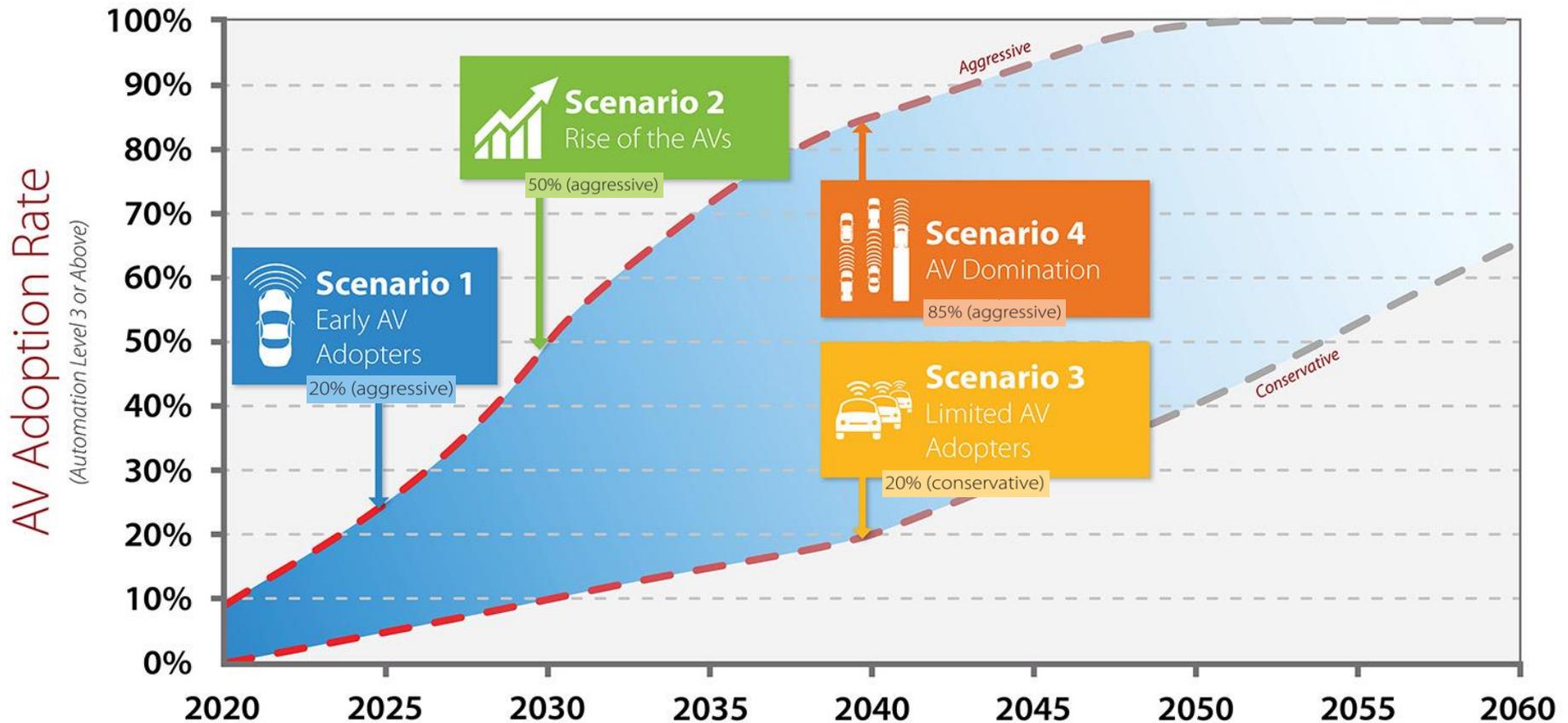
# Automated Vehicles & Emerging Technology

Figure 3. Automated Vehicle Technology



# Adoption Rates

## Automated Vehicle (AV) Market Adoption

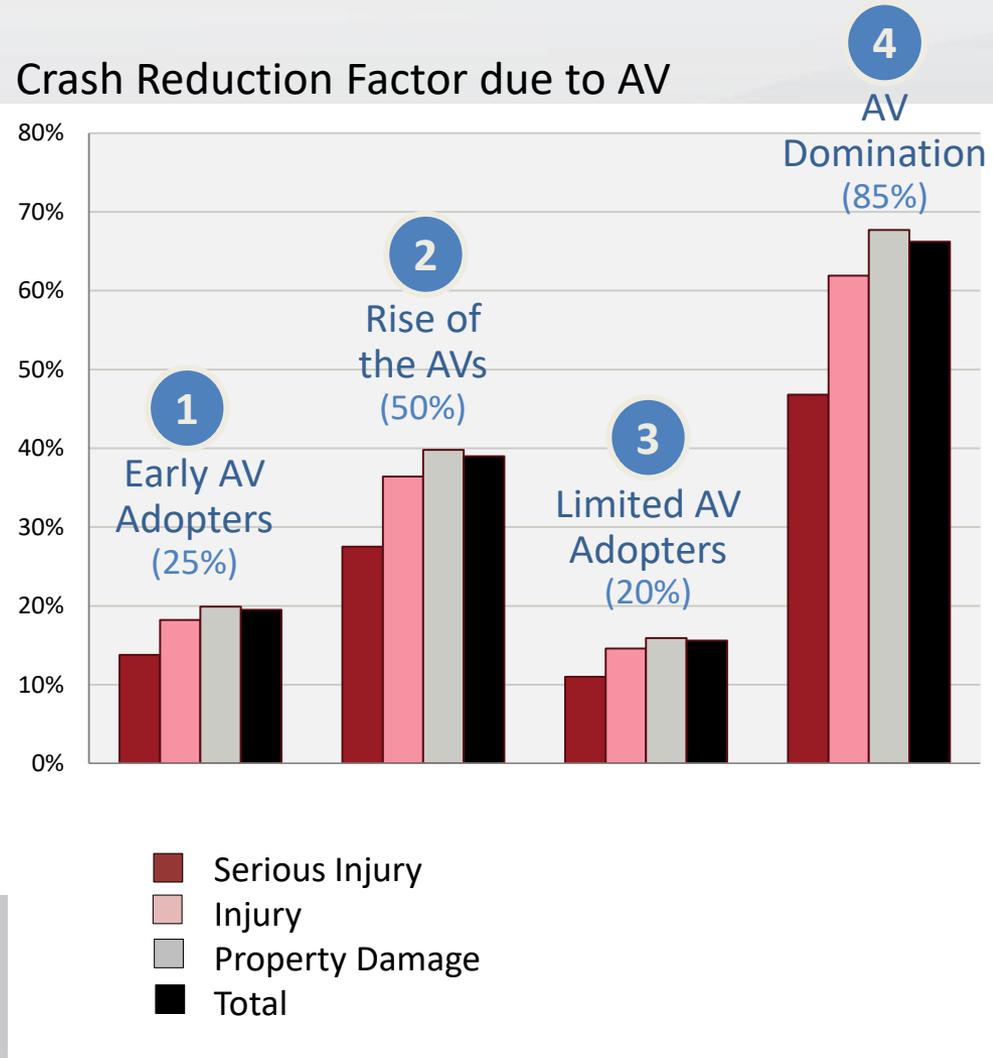


The I-80 Planning Study and market adoption rates and impacts of vehicle automation are informed by industry leading research by University of Texas, University of California at Berkeley, Victoria Transportation Policy Institute and Goldman Sachs. The scenarios ranged from conservative to aggressive in market adoption.

# Safety Analysis Results

## I-80 Predicted Crash Rates

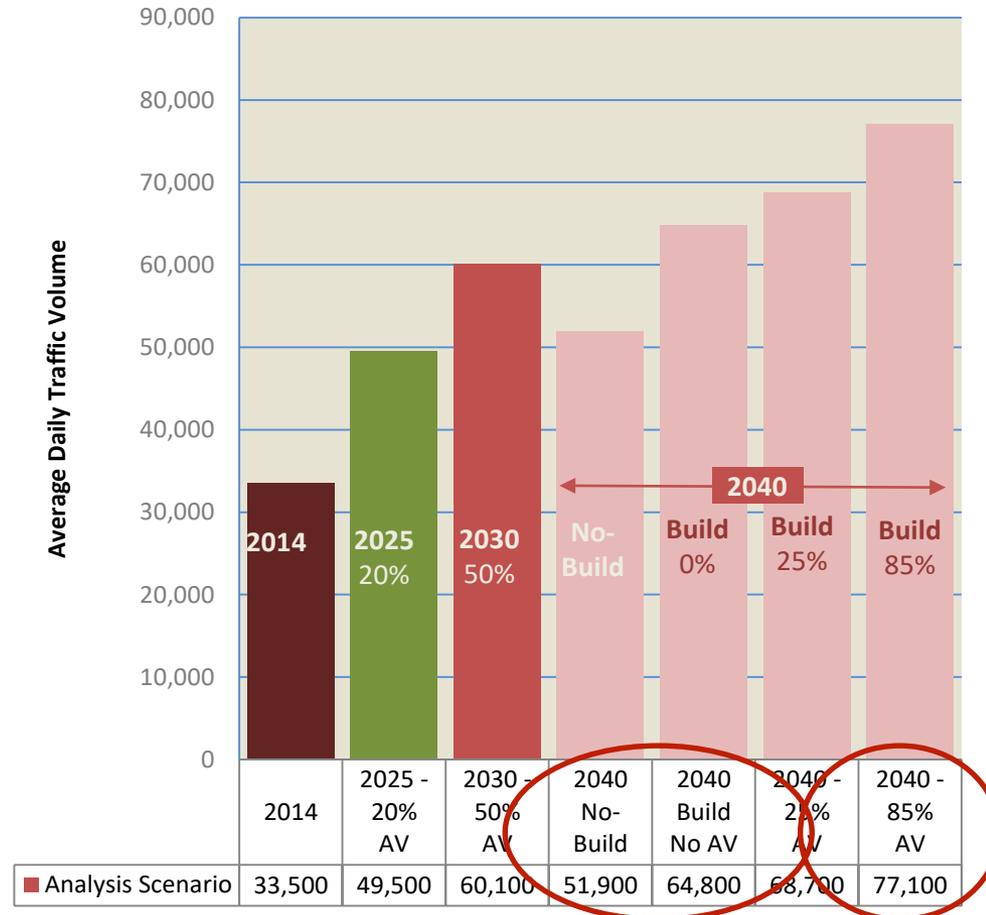
- Introducing automated vehicles reduces crashes
- Reductions near 70% of total crashes for 85% AV



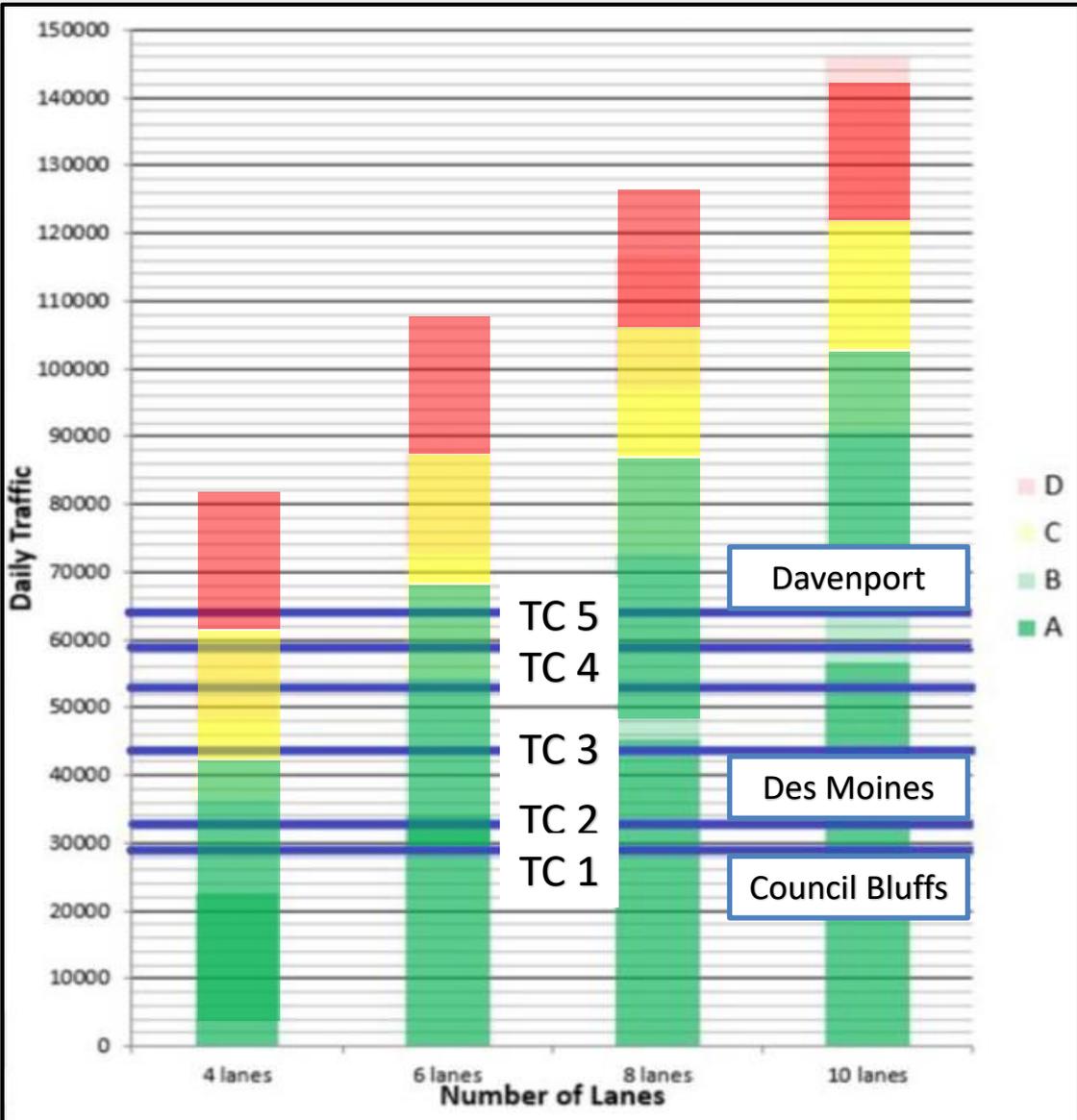
# Traffic Analysis

- DOT Statewide travel model runs
  - 2040 4-lane I-80
  - 2040 6-lane I-80
- Research on AV impact to demand
  - Induced trips due to AV
  - Potentially longer trips as well

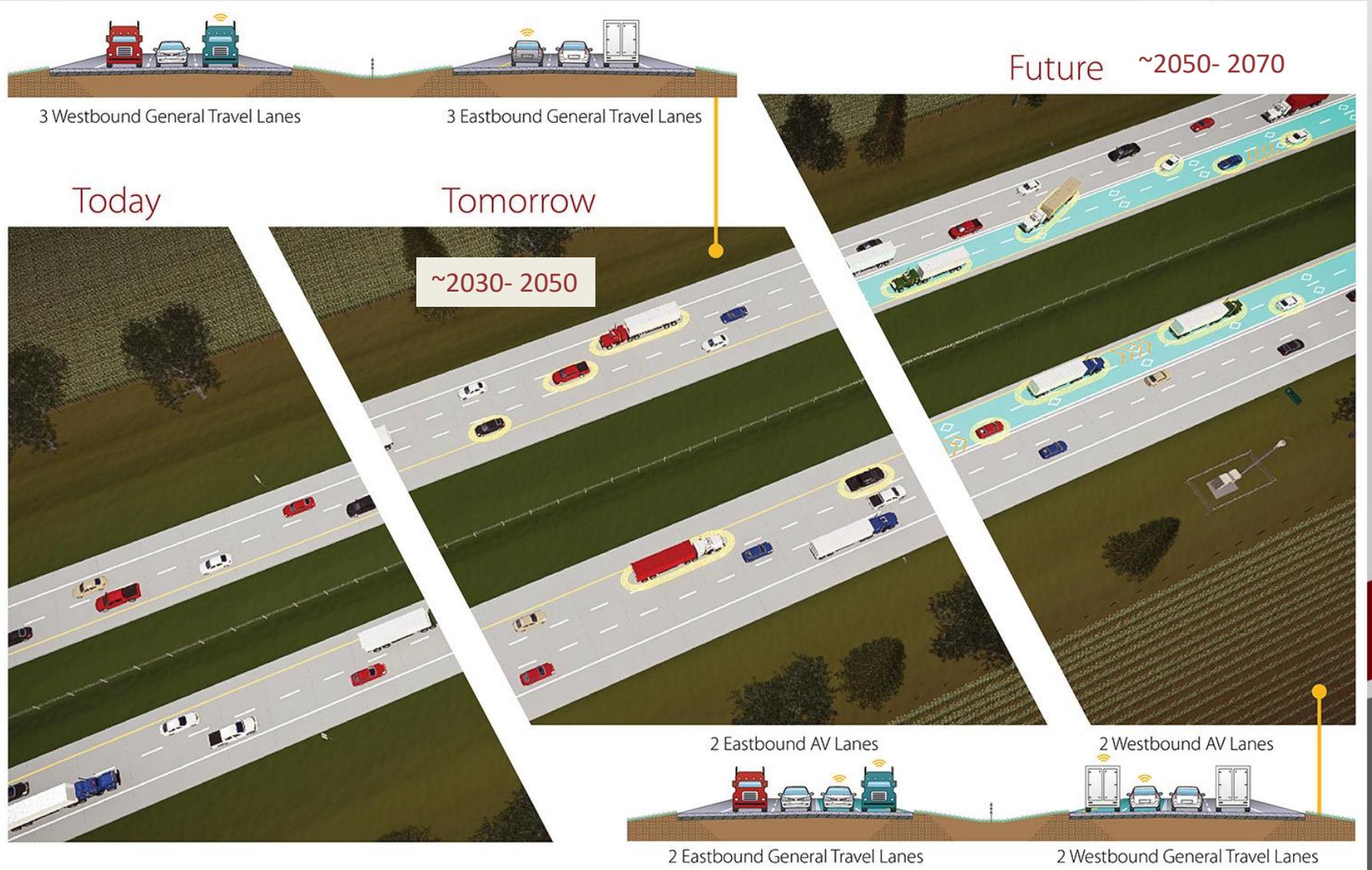
## Traffic Demand by Future Year and AV Market Penetration



# Traffic Analysis



# Design Elements



# STUDY RESULTS

2040 Scenarios versus Existing Conditions

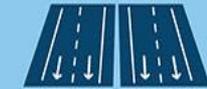
Data based on studies and analyses of two to five general segments of rural I-80.

SAFETY

TRAFFIC CAPACITY

RELIABILITY

4-Lane I-80  
UNIMPROVED IN THE YEAR 2040



Average **crashes** per mile will **increase 9%** with little change to the number of **fatal** and **major injury crashes**\*



\*(with a 48% increase in volumes)

Vehicle crowding will increase by **55%**

causing **average speeds** to decrease **5%**



Overall **travel times** will grow, increasing the **Misery Index**



**6 to 12%**



6-Lane I-80  
IMPROVEMENTS



Average **crashes** per mile will **increase 14%** with little change to the number of **fatal** and **major injury crashes**\*

\*(with a 72% increase in volumes)

**20%** less vehicle crowding

and average speeds **remain the same** as today



**Misery Index**



Slight improvement

**1 to 8%**

6-Lane I-80 with AV  
IMPROVEMENTS



Average **crashes** per mile will **decrease 59%** and **fatal** and **major injury crashes** will **decrease 50%**\*

\*(with a 104% increase in volumes)

**35%** less vehicle crowding

and average speeds **increase 2%**



**Misery Index**



More improvement

**-1 to 3%**

# Modal Options – Technical Memo

Non-highway options evaluated in their ability to solve, or at least improve, mobility across rural portions of I-80 include:

- Intercity Passenger Rail/High Speed Rail
- Commuter Rail
- Over-the-Road Bus
- River Freight
- Air Freight
- Rail Freight
- Park-and-Ride
- Paratransit
- Trails
- Special Generator Services
- Passenger Air Service



# Modal Options

Coordination opportunities were identified for further evaluation and subsequent environmental and engineering studies which may include the following:

- Intercity Passenger Rail/High Speed Rail
- Park-and-Ride
- Trails
- Over-the-Road Bus



# I-80 Toll Financing Study

## Why is Iowa DOT doing an I-80 toll study?

- I-80 needs improvements. DOT has a responsibility to look at financial options for improvements.
- Evaluate “Pay as you go” versus Alternative Financing
- The potential for toll funding can help answer certain questions:
  - What is optimal improvement strategy?
    - General widening (6 General-Purpose lanes)
    - Freight focused ( 4 truck lanes and 6 GP lanes)
  - How fast can strategy be implemented?



# Comparing Funding Options for I-80 Vision

Item	Pay-As-You-Go Funding	Toll Funding
Construction Completed	2040	2026
Period of Construction	18 Years	5 Years
Cost (with Inflation)	\$4,326 million	\$3,861 million
Source of Construction Funding	Federal/State Funds	Toll Revenue Bonds
I-80 Maintenance Cost (2018-2050)	\$2,762 million	\$551 million
Travel, Safety and Economic Benefits	Full Benefit in 2041	Full Benefit in 2027
% of Existing Funds for Vision (2018-2040)	71%	0% *
Funding Available for Other Interstates (2018-2040) **	\$1,754 million	\$6,080 million

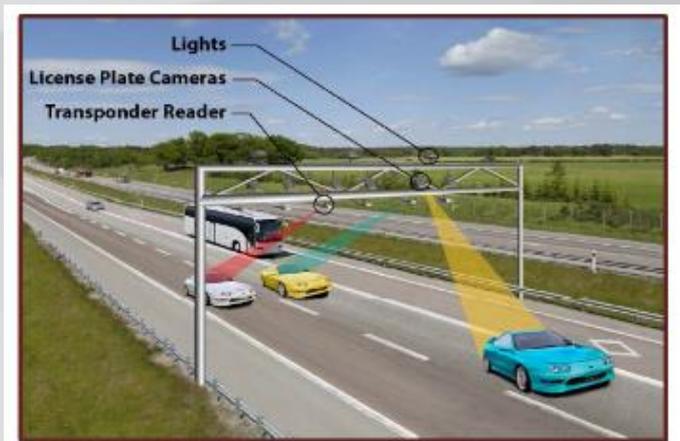
\* Full financial feasibility would be determined through refinements in toll program costs, toll pricing, revenue and/or financing terms

\*\* also for I-80 stewardship needs prior to reconstruction



# Electronic Toll Collection

**Transponders and License Plate Toll Collection:  
No Cash Toll Plazas or Booths**

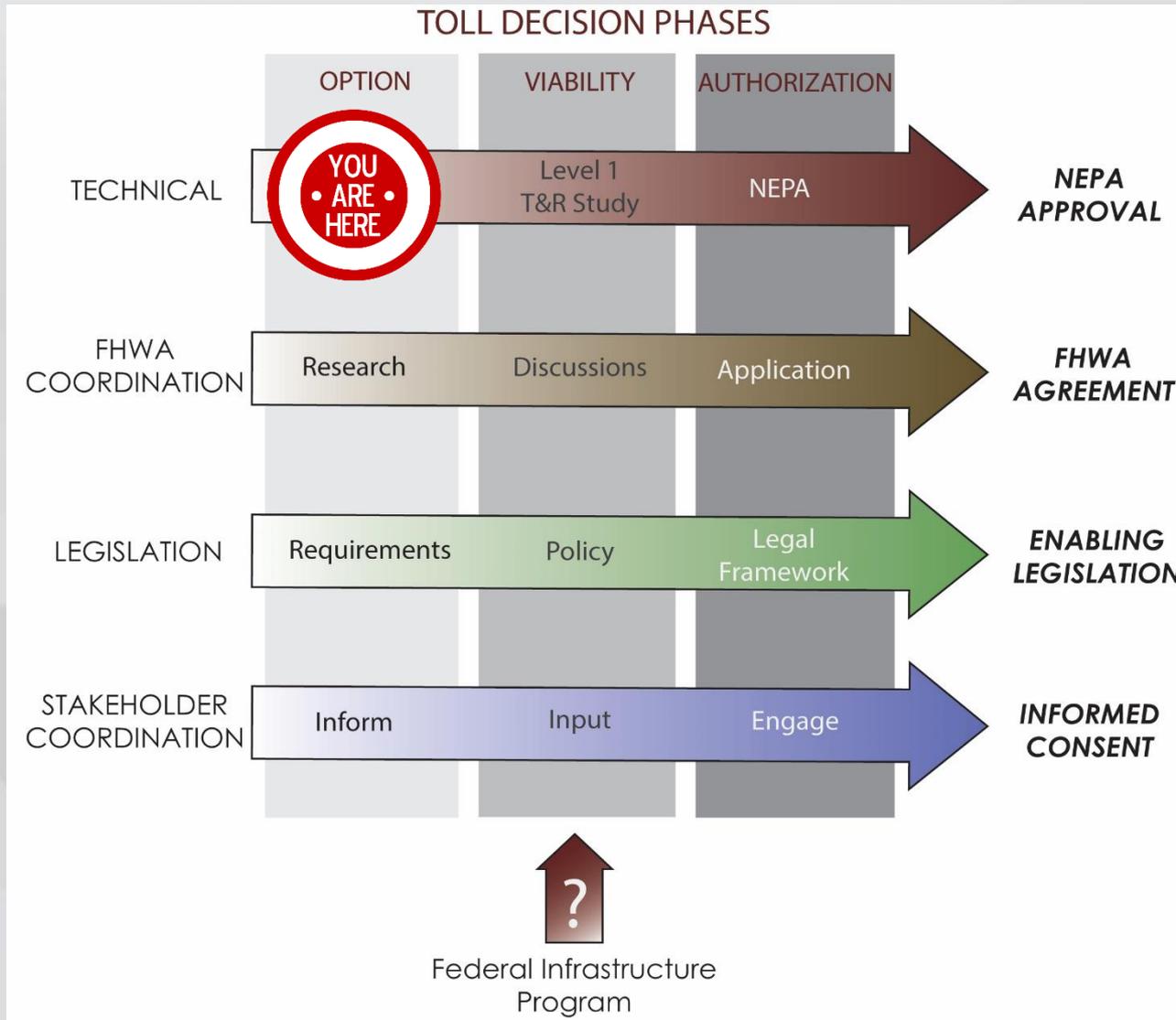


# What questions did the Toll Financing Study answer? (based on the initial level of evaluation)

- Is tolling financially feasible?
  - Yes, for 6-lane concept
- What would tolling look like?
  - All lanes tolled, open road concept
- What are the benefits?
  - I-80 could pay for itself, built quicker, open up capacity sooner, allow traditional funding to go to other priorities
- What are the challenges?
  - Changes in policy, public acceptance, how would tolling impact travel patterns, plus others



# Overall Viability of Tolling Rural I-80



# I-80 PEL Study – key takeaways

## Study Outcomes:

- Recommended long-term **I-80 Vision**
- Recommended implementation plan

## Next Steps:

- Public Involvement
  - Online public meeting – February 2018
  - In-person public meeting – late Spring 2018
- Final Tech Memo – Vision for Infrastructure Investment
  - Wrap-up document that utilizes recommendations from the other technical memos
  - Identify improvement strategy
  - Prioritize sections for construction
  - Funding strategy





QUESTIONS ???